MARINE REVIEW.

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Buffalo Line Boat Matters.

At least two charters of vessels to carry flour and package freight all of next season from the head of Lake Superior to Buffalo, one of them at 75 cents per net ton free, have already been made, and considerable figuring has been going on between the Buffalo line managers and owners of big steel steamers that are fitted with gangways and apparatus for handling such freight. The rate noted is, of course, very much lower than the figure at which this business has been done in previous years, but it is probably justified by the poor outlook in other lines.

Several rumors from Minneapolis and Buffalo of late have connected John Gordon, general manager of the Northern Steamship Company, with plans for increasing the business of the Union Transit Company by a close alliance with the Northern Pacific Railway in the northwest and the Erie Railway from Buffalo. Mr. Gordon is interested in the Union Transit Company, and when he visited Minneapolis several days ago with Mr. French of that company, it was said that the object of the visit was to see Mr. Hannaford of the Northern Pacific in furtherance of a close alliance between that company and the Union Transit Company. It was noted in connection with the visit to Minneapolis that Mr. French stands very close to the heads of the Erie railway, his canal line being practically an Erie railway line. Coupled with these statements was a report from Buffalo that Mr. Gordon had made arrangements with M. A. Hanna & Co. of Cleveland for chartering the six steel steamers of the Menominee Transit Company, which have for three or four years been engaged in the ore trade, but for which the Cleveland firm has not been able to furnish full employment in carrying its own ore. The intimation in these reports was that an alliance of such importance between the Northern Pacific and Union Transit Company would prompt Mr. Gordon's retirement from the management of the Northern Steamship Company and all connection with the Great Northern railway, but if the outside reports are as lacking in reality as the connection of the Menominee steamers with such a deal, there is not much in them.

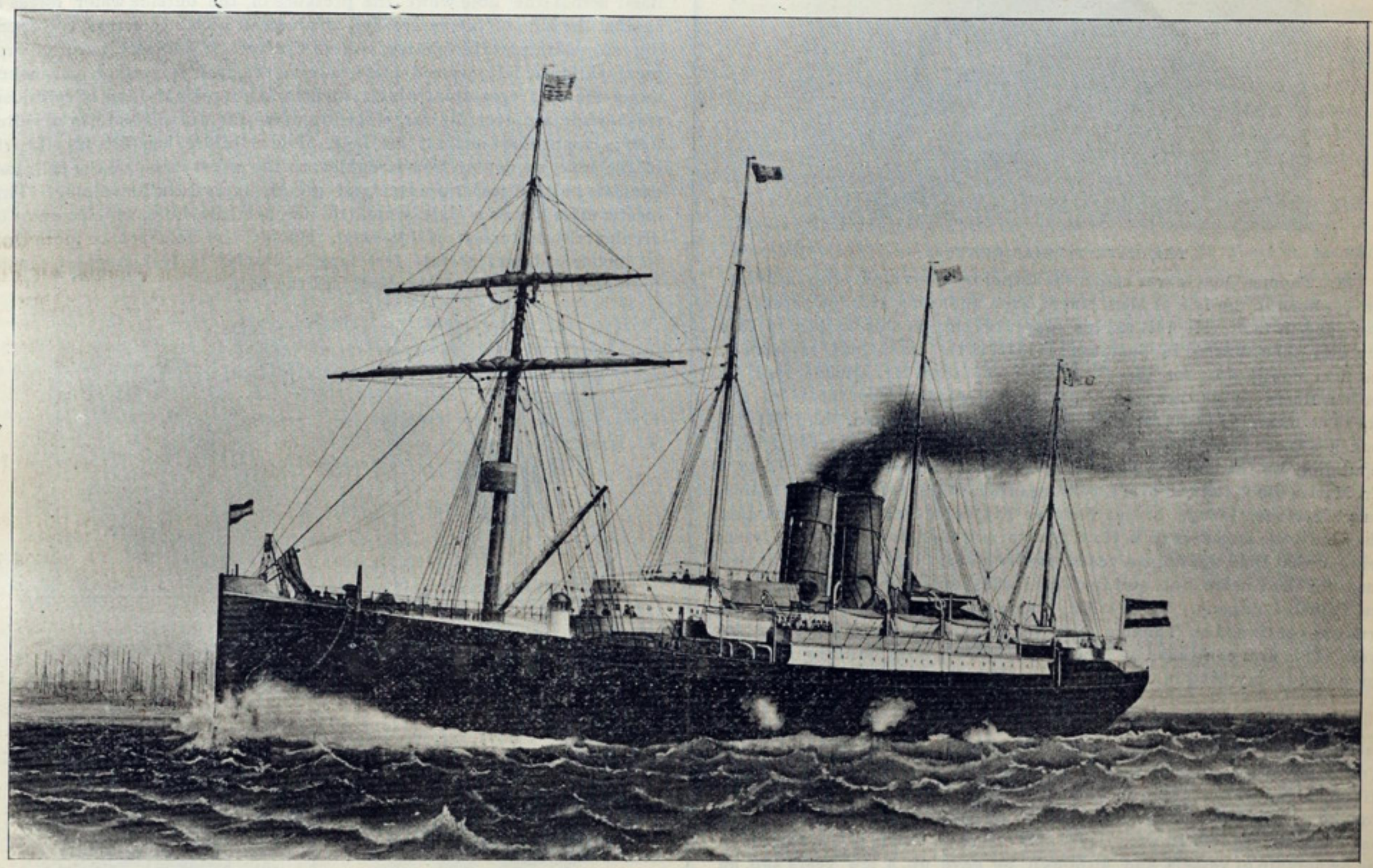
Mr. L. C. Hanna, president of the Menominee Transit Company, says that the directors of his company some time ago thought of cutting gangways into two or three of the boats and equipping them with hoisting gear, so as to be in a position to take advantage of anything in the way of improved freights that might be offered in the flour or package freight trade and they were considering such a change now as regards two of the boats wintering in Cleveland, but they had no offer from the Union Transit Company or any of the Buffalo lines for charter next season, and he was of the opinion that there was no truth in the reports about the Union company. If two Menominee boats are altered for the flour trade the change will be made simply with a view to equipping them for general business or having them in shape for sale if any opportunity should offer.

Appropriations for Revenue Cutters.

For a year past the revenue cutter service, treasury department has had $150,000 appropriated by congress to begin the construction of two first class revenue cutters, one for the lakes and one for the New England coast, to cost $175,000 each. For some reason the bureau has delayed asking for bids on these boats, but it is probable now that the plans will be submitted to builders shortly. as the civil sundry appropriation bill, which has just passed the house, contains two items appropriating $200,000 more, or $350,000 in all, for the completion of the ships. The bill also contains an item of $50,000 for beginning the construction of a third cutter of the same class, to be stationed on the Pacific coast.

Other lake items in this appropriation, additional to those for lights, and fog signals noted elsewhere, are as follows:

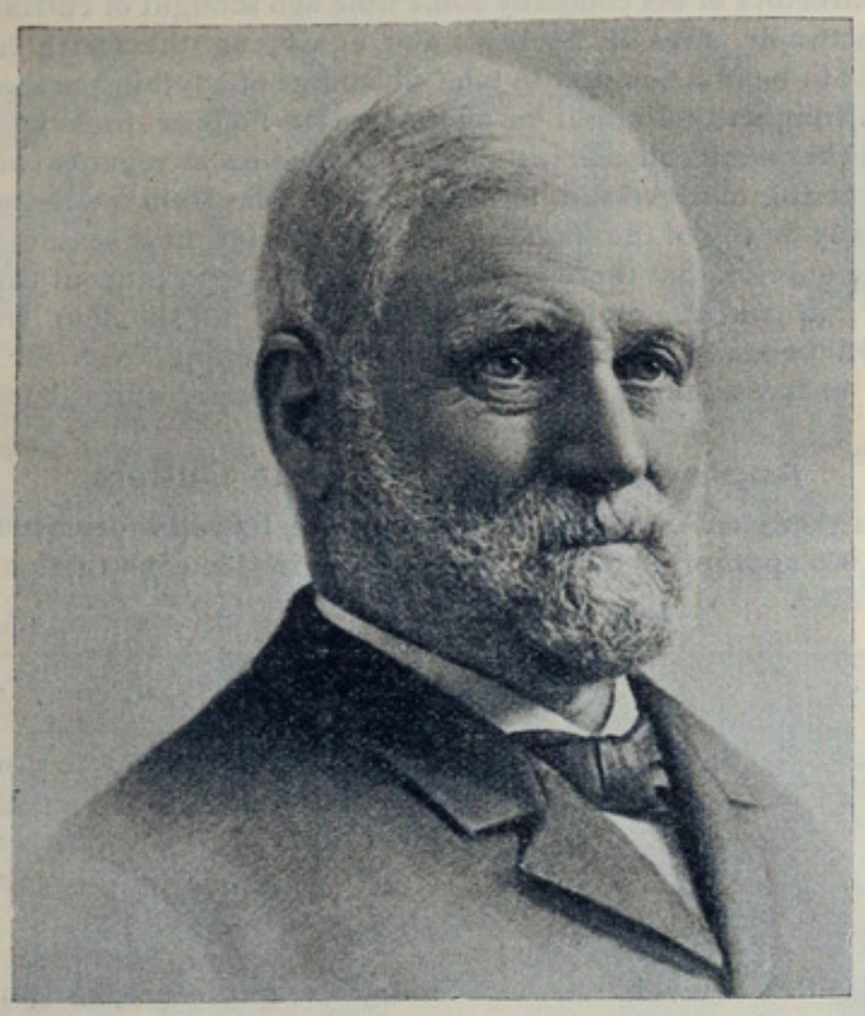
For completing improvement of St. Mary's river at the falls, Michigan, $483,865; for improving channels connecting the waters of the great lakes between Chicago, Duluth and Buffalo, $500,000; for printing and issuing charts for the use of navigators and electrotyping plates for chart printing, $2,000; for surveys. additions to and correcting engraved plates, to be available until expended, $25,000; for extension to marine hospital buildings at Chicago, $10,000.



NORTH GERMAN LLOYD ATLANTIC LINER ELBE.
Sunk by collision in the North Sea, off the coast of England—Attended by the loss of 335 persons.

Death Thinning the Ranks of Vateran Lake Men.

Death has removed from the ranks of vessel owners and ship builders during the past week several veterans who have had a great deal to do with the advancement of lake shipping. Thomas Quayle of Cleveland and Thomas Davidson of Milwaukee, whose lives form a part of the history of wooden ship building on the lakes, are among the number. Announcements have also been made of the death of H. P. Card and Capt. John Gerlach, who were interested in vessel property in Cleveland, and Addison Kelley of Kelley's island, Lake Erie.



THE LATE THOMAS QUAYLE.

Mr. Thomas Quayle was called the father of Cleveland ship builders. He was born in the Isle of Man, May 9, 1811, and came with his parents to Cleveland in 1827. He finished his apprenticeship as ship builder in this city, and then started in business in 1847, with James Cody as partner, the firm continuing for three years. Soon after Mr. Quayle took in Luther Moses as partner, and they had sometimes seven boats on the stocks at once. In two years Mr. Moses left the firm, and John Martin took his place, and boats built by Quayle & Martin have still a high reputation on the lakes. In one year they built thirteen vessels. In 1874 Mr. Martin died, and the firm was reorganized under the name of Thomas Quayle & Sons, George L. and Thomas E. Quayle being made partners. They built the steamers E. B. Hale, Sparta, and the Commodore, the latter being at that time the largest vessel on the lakes. In 1878 they built two boats for the Anchor line, and two, the Buffalo and Chicago, for the Western Transit Company. In 1882 Mr. Quayle retired from business, and the firm was continued as Thomas Quayle's Sons, William E. entering the firm. This firm continued as long as the wooden ship building industry amounted to anything in Cleveland.

Capt. Thomas Davidson, who died at his home in Milwaukee on Saturday last, was for a great number of years a member of the firm of Wolf & Davidson, who conducted the principal dry dock plant on Lake Michigan and who were the builders as well as owners of some of the best wooden vessels on the lakes previous to the change to steel ships. Capt. Davidson was associated with David and Frank L. Vance of Milwaukee in the ownership of vessels, and although he gave up, a few years ago, an active interest in the management of the Milwaukee dock and ship yard, he was at the time of his death president of the Wisconsin Steamship Company, controlling the steamers Thomas Davidson and Schlessinger.

Henry P. Card was a lifelong resident of Cleveland. He was part owner of some of the vessels in the Bradley fleet, and was more or less interested in lake trade through a coal business which he conducted for about thirty years. He was fifty-two years of age.

Capt. John Gerlach, also of Cleveland, owned the schooner Eliza Gerlach, and was interested in the Minch Transit Company. He was the father of Capt. Wm. Gerlach, who has for some time been in charge of the best vessels of the Minch fleet.

Apparatus for Stopping Leaks.

The value of cellulose for stopping leaks in vessels of war is so well established that the United States navy, as well as the navies of several European countries have given a great deal of attention to methods of storing and carrying it for use in emergencies, where immediate action is required to prevent a heavy inflow of water resulting from injury of any kind to a ship. The accompanying engravings illustrate a device that is intended to apply bags of cellulose to holes of moderate size that may result from stranding, collision or other causes. It would seem that on the lakes, where steel vessels frequently meet with accidents causing water bottoms to fill up, or resulting in dangerous leaks in different parts of the hull, that cause delay in completing voyages and reaching docks, this apparatus might be used to advantage. It is called the Colmes leak arrester, and patents on it are controlled in this country by the Franco-American Cellulose Company of Philadelphia.

The apparatus for applying the cellulose to the hole is extremely simple. It is composed of a steel rod, threaded on a part of its length, at the end of which is pivoted an iron piece, which, when at right angles to the rod, has the appearance of a pickaxe, one of the arms of this cross piece being heavier than the other. This cross piece has fixed to it an oval piece of flat iron covered on both sides with thick felt. A small conical bag, filled with cellulose and having a hole through its center, can be slid on to the rod. Back of this bag is applied a large washer, which is held in place against the bag, as shown in Figs. 2 and 4, by a nut which is pushed down the rod to the threaded part, where it engages the screw. When a leak has been located any man can seize a leak stopper corresponding approximately in size to the width of the hole. Then holding it with the lighter end of the pick toward him, so that the pick and oval plate lie alongside the rod, he can introduce it into the hole. He can avoid the rush of water by standing to one side. As soon as the pick has passed through the plating the heavier end descends and the pick places itself across the hole while the pressure of the outside water forces it against the side of the vessel and throws the pick arm across the opening, so, resting on the plating around the hole, it affords a point of support, while the felt covered plate reduces the leak very much and makes easier the next operation, which consists in slipping the bag of cellulose, washer and nut over the rod, screwing down the nut till the bag of cellulose is compressed against the hole. The cellulose bag fills up all parts of the hole, no matter how irregular, as the great value of the cellulose consists in its absorbing water and greatly increasing its volume. This elastic mass makes a tightly applied mat over the hole, which cannot be accidentally disturbed or displaced. Should the hole not be more than 10 inches wide and several feet long, a number of leak stoppers can be used side by side so as to gradually fill the hole.

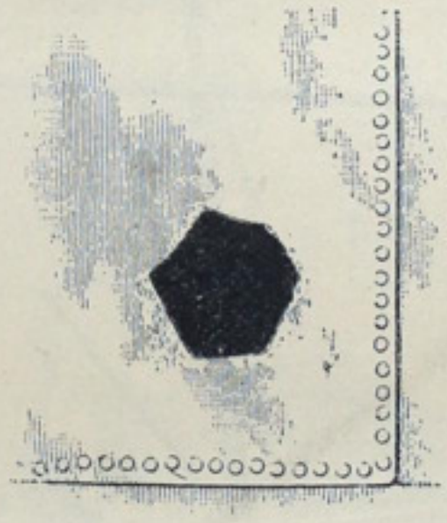


Fig. 1.—Shape of Hole No. 2.

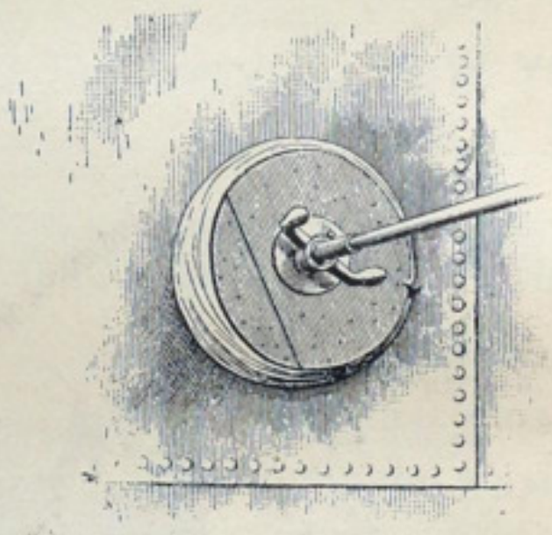


Fig. 2.—Small Hole Stopped.

Fig. 3.—Shape of 21-Inch Hole

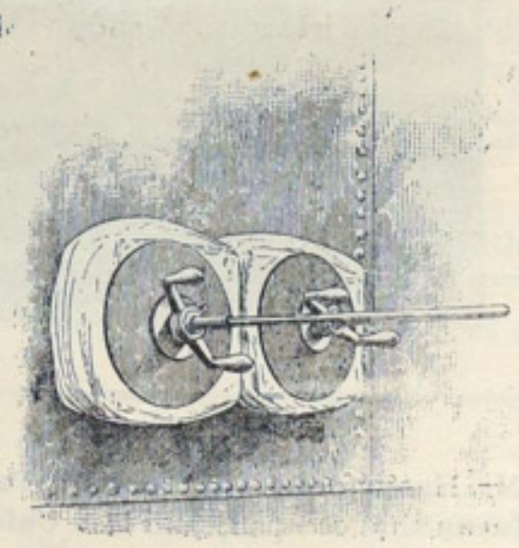


Fig. 4.—Hole, Fig. 3, Stopped.

Tests of this apparatus were made before a board of naval engineers at Philadelphia a short time ago. The leak arresters were to be placed in three holes cut in the sides of an iron tank. The smallest hole was circular with burred edges, and was 2½ inches in diameter; the next, Fig. 1, was hexagonal, about 10 inches wide, its area being about 72 square inches; the third, Fig. 3, was very irregular in shape and about 21 inches long, the average width being about 5 inches and the area 85 square inches. It being understood that the stoppers are intended to be used from the inside of the ship, the tanks were supposed to represent the sea. The time employed to close the holes was as follows: 2½-inch hole, 30 seconds; 10-inch hole, 1 minute; 21-inch hole, 3 minutes.

Operation of Cleveland-Cliffs Steamers.

Through the kindness of Mr. J. H. Sheadle, secretary of the Cleveland-Cliffs Iron Company, the REVIEW is enabled to present in the table that follows some interesting data relative to the operation of that company's steel steamers during the season of 1894. Particulars of the boats, their engines and boilers are contained in the following paragraphs:

Pontiac—Hull, 320 feet over all, 300 feet keel, 40 feet beam, 25 feet moulded depth; engines, triple expansion, 24, 38 and 61 by 42 inches; boilers, three, Scotch type, 11.5 by 14 feet, allowed 160 pounds steam.

Frontenac—Hull, 289 feet over all, 271 feet keel, 39.6 feet beam, 24 feet moulded depth; engines, triple expansion, 20, 31 and 52 by 40 inches; boilers, two, Scotch type, 12.9 by 14 feet, allowed 150 pounds steam.

Pioneer—Hull, 241 feet over all, 225 feet keel, 35 feet beam, 17.5 feet moulded depth; engines, triple expansion, 20, 33 and 54 by 42 inches; boilers, two, Scotch type, 12 feet diameter and 11.5 feet long, allowed 160 pounds steam and fitted with Howden system of hot draft.

Cadillac—Hull, 244 feet over all, 230 feet keel, 37 feet beam, 19 feet moulded depth; engines, 15, 25 and 42 by 36 inches; one boiler, 13 by 11.5 feet, allowed 160 pounds steam.

PERFORMANCE OF STEAMERS OF CLEVELAND-CLIFFS IRON COMPANY OF CLEVELAND, SEASON OF 1894.

	PONTIAC.	FRONTENAC.	PIONEER.	CADILLAC.
Days in commission	233	243	234	223
Days in port	68	79	66	80
Days sailing	147½	140	155	124
Days lost by bad weather	7½	7	4	12½
Days lost by accidents	.....	7	½	½
Days waiting at "Soo" canal	10	10	8½	6
Trips made	27	24	37	22
Cargoes carried	31	27	41	28
Gross tons freight carried	74,188	59,452	63,406	54,181
Miles run	43,395	38,331	47,144	30,598
Miles run per hour	12.27	11.42	12.71	10.34
Net tons fuel used	4,323	3,738	4,021	1,881
Average pounds fuel per mile	199	195	170	123
Cost lubricants per mile	.....	.....	.....	.....

A remarkable feature of the foregoing statement is the number of trips made by the Pioneer. She made thirty-seven trips, carrying up loads on four of them. Three of the trips were to the head of Lake Superior and all others to Marquette. Three of the cargoes of coal were taken to Marquette and one to Detour. The Pioneer unloaded twenty-eight of her cargoes at the fast hoist, Cleveland & Pittsburg dock, Cleveland, and her time of discharging these cargoes, which averaged about 1575 gross tons each, was 6½ to 8 hours. Her number of trips is undoubtedly greater than that of any other boat in the ore trade.

Appropriations for Aids to Navigation.

Appropriations for lights, fog signals, etc., on the lakes, contained in the sundry civil appropriation bill, which passed the house a few days ago, aggregate $126,500. The bill contains eleven items as follows:

Chequamegon point light and fog signal station, Wisconsin—For moving and rebuilding the main La Pointe light and establishing a harbor bell and light at or near Chequamegon point, Lake Superior, $10,000.

Devil's island light and fog signal station, Wisconsin—For constructing a permanent tower, $22,000.

Grand Marais light station, Minnesota—That of the unexpended balance of the appropriation made in the act approved March 3, 1885, for completing the construction of a light-house at Grand Marais, Minnesota $4,000 may be applied to the purchase of a site for construction of a light-keeper's dwelling, at or near Grand Marais light station.

Mendota light station, Michigan—For reestablishing the light station at or near Mendota, Bete Grise bay, entrance to Lac la Belle, Lake Superior, Michigan, $7,500.

Portage lake ship canal pier head fog signal, Michigan—For establishing a fog signal at Portage lake ship canal pier head light station, Lake Superior, Michigan, $5,500.

Manitowoc light station, Wisconsin—For establishing a steam fog signal at Manitowoc pier head light station, Lake Michigan, Wisconsin, $5,500.

North Manitou light and fog signal station, Michigan—For establishing a light and fog signal station on North Manitou island, Lake Michigan, Michigan, $20,000.

Porte des Morts range lights and fog signal station, Michigan—For establishing range lights and a steam fog signal on or near Plumb island in the Porte des Morts (Death's Door) passage; entrance to Green Bay, Lake Michigan, $21,000.

South Fox island fog signal, Michigan—For establishing a steam fog signal at South Fox island light station, Lake Michigan, $5,500.

Sturgeon Bay canal light station, Wisconsin—For establishing a light station at or near the entrance to the Sturgeon Bay ship canal, Lake Michigan, $20,000.

Sheboygan pier head light station—For establishing a steam fog signal at Sheboygan pier head light station, entrance to Sheboygan harbor, Wisconsin, $5,500.

In addition to these items, all of which will probably be retained by the senate, it is expected to secure in the senate amendments providing $15,000 for a light and signal at Grand Marais harbor of refuge, Lake Superior, Michigan, and $5,500 for a fog signal at Eagle Harbor. Other appropriations that will be sought in the senate are: Lights, Grassy island, Detroit river, $6,700; Middle island, Lake Huron, light and fog signal, $15,000; Little Bay de Noque, light, $5,000; Gravelly island, Poverty passage, light, $5,000; Lansing shoal, gas buoy, $5,000.

To Settle the Battle of the Boilers.

In view of suggestions made by the REVIEW regarding advantages offered in the two 400-foot freight steamers building at South Chicago for a test of tubulous and Scotch boilers in ships that are identical in every way, it gives us pleasure to print the following correspondence:

Office of the Chicago Ship Building Company,
101st Street and Calumet River,
CHICAGO, Ill., Feb. 5, 1895.

Editor MARINE REVIEW: We have the pleasure of enclosing to you herewith, copy of letter received from Commodore Melville which, as in line with your recent articles on the subject, you are at liberty to publish if you so desire.

W. I. BABCOCK, Manager.

Department of the Navy, Bureau of Steam Engineering,
WASHINGTON, D. C., Jan. 31, 1895.

Gentlemen: The bureau acknwledges with thanks the receipt of your letter of the 29th instant, in which you offer to place the two steamers you are building, one with the Scotch and the other with Babcock & Wilcox boilers, at the disposal of the bureau for test as to the comparative merits of the two types of boilers.

The bureau will be pleased to accept your generous offer and will endeavor by all means possible to make the test as complete and as comprehensive as possible, in order that there may be no question about the result. The opportunity is an unusual one, the identity of the two steamers, except in boilers, being such as to eliminate many points of contention which have arisen when similar ships have been tried with different types of boilers, but also with modifications in the engines or screws and thus left room for controversy afterwards.

The bureau will be quite ready to co-operate with you later regarding the arrangements for the tests, which it believes will be of great interest in themselves and valuable to the engineering profession generally.

In conclusion, the bureau wishes to say that this offer of yours is a very generous one and one that is highly appreciated; and the liberality which inspires it can but win the admiration of the engineering world.

G. W. MELVILLE,
Engineer in Chief, U.S.N,
Chief of Bureau.

To Chicago Ship Building Company,
101st Street and Calumet River,
Chicago, Ill.

A Discouraging Outlook.

Ohio coal operators are still engaged in perfecting details of the two general companies, one for Hocking Valley railway mines and the other for Toledo & Ohio Central mines, through which it is expected to regulate the output of soft coal in Ohio and provide for the sale and movement of all of it by the two corporations. Some matters pertaining to the agreements between companies mining Bessemer ore in the Lake Superior region are also understood to be partially unsettled as yet, so that there is no talk of sales of either ore or coal for next season's delivery and consequently no negotiations regarding freights. There is certainly nothing encouraging in the outlook for vessel owners. Most ore shippers are of the opinion that they could go into the market and charter a large number of big vessels at 75 cents a ton on ore from the head of Lake Superior, but under present conditions any talk of rates is valueless, and vessel owners simply say that when the outlook has been most gloomy in the past, the best seasons have followed, and they refer to years like '91 when there was absolutely no business to cause fitting out in the spring.

Contracts for Steel Schooners.

The announcement from Chicago that a contract has been closed for a steel schooner 365 feet over all has reference, undoubtedly, to negotiations being carried on by John Corrigan and others of Cleveland for such a boat, and although all the details have not as yet been completed it is very probable that the schooner will be built and that she will tow behind the big wooden steamer Aurora. It is expected that she will carry 4,500 net tons on Lake Superior draft.

It is expected also that a contract for another steel schooner, to carry about 3,000 gross tons from Lake Superior and to tow with a large wooden steamer already in commission, will be closed in Cleveland today.

Plain Talk from Com. Melville.—The Enginers.

A feature of the late meeting in Washington of the national organization, Marine Engineers' Beneficial Association, was the attendance at one of the sessions of Commodore George W. Melville, engineer-in-chief of the navy, and his election to honorary membership in the association. With characteristic independence, Commodore Melville referred to the order of Charles Foster, ex-secretary of the treasury, in refusing to remove alien engineers from the American Line steamers Paris and New York as infamous and unjust. "This order," he said, "was a needless aspersion of our abilities. It has gone round the world, and has had an effect which it will take years to eradicate. Every engineer, whether he be one who spans rivers with bars of steel, or one who builds the locomotive which speeds over every part of this broad land, whether he drives the magnificent ships which still carry the American flag, whatever his particular branch may be, should unite in common cause to restore the status of men who have been so unjustly aspersed."

Commodore Melville addressed the engineers as "fellow chips, brothers and members of my own profession." It is well known, of course, that he has been fighting for recognition for engineers in the navy while the organization of which he was made a member has been making a similar fight in the merchant service, but it was hardly expected that he would be so outspoken in a gathering that was semi-public, and the proceedings of which are about certain to reach ears of men of influence in national affairs who will not take kindly to such criticism.

For several years past Supervising Inspector-General Dumont and members of the board of supervising inspectors have been invited to meet the engineers in session, and each year the invitation has been accepted. Unlike Commodore Melville, Gen. Dumont does not, however, commit himself to any great extent, although he does practically all the talking for the board. These meetings with the inspectors have at all times resulted unsatisfactory to the engineers, on account of their acknowledged opposition to the management of the inspection service and their inability to obtain from the chief of the service a direct answer covering any of the numerous questions propounded to him. But the chief never fails to accept an invitation from the engineers, however unpleasant may be some of the features of controversy that are certain to result at each succeeding meeting. At this last meeting President Uhler of the association referred to the action of ex-Secretary Foster in the case of engineers on the New York and Paris as outrageous, and Dumont entered an immediate protest, saying that he could not listen to any censures upon the official course of his superior officer. He remained to hear the grievances of the engineers and to answer them in his own way, however, and will undoubtedly accept an invitation to call another year, if it is extended, but the engineers will probably be the first to cry quit, as there is a manifest disposition among the latter to dispense with such meetings, for which there was never any good excuse, if the difference existing between the two organizations had been fully taken into account.

Among new matters brought up at the meeting was a resolution providing that each subordinate association may elect honorary members from among citizens, not engineers, who desire to aid the engineers in their work. This resolution was carried. A resolution brought up by the delegates from San Francisco provides that the national association should adjust the representation allowed each association upon the basis of the numerical strength of each association, so as to give to each subordinate association having less than fifty members, one delegate; for fifty members and not over 100, two delegates; to each association having a membership of over 100, one delegate for each additional hundred members in excess thereof.

Performance of a New York Harbor Tug.

The tug El Toro of the Morgan Line, New York, is a boat built a few years ago by the Newport News Ship Building and Dry Dock Company from designs of Horace See, New York, and fitted with the See quadruple expansion engine. The following is given as her performance during the calendar year 1894:

Steamships towed from Morgan Line piers to Erie basin, or distance equal thereto, 70; steamships towed from pier No. 37 to No. 25, 132; steamships docked at piers No. 37 and No. 25, 152; lighters towed and moored, 520; miles run without tow, 5,342; on fire duty, remaining time; days in commission, 351; coal consumed per day, 1⅛ tons. Full pressure of steam was kept on the boiler for the entire twenty-four hours each day. Boiler was in operation four months without opening.

A Very Fast Passenger Boat.

The Flyer is the name of a steamer that makes four daily trips on Puget Sound between Seattle and Tacoma. In 1894 she made the record of 68,695 miles between those two cities. The total loss of time for the year was only forty-three minutes. There was considerable fog and smoke over Puget Sound at times during the year, but the Flyer went right through, always being on time, come what might. The distance between Seattle and Tacoma by water is 27½ miles; by land it is about 40 miles. The Flyer is run in competition with the through trains, and practically makes the same time, so that it is a popular means of travel. The round trip of 55 miles between the two cities is covered in three hours, and the four trips a day make the total distance traveled daily 220 miles. The Flyer is a screw boat 200 feet long and runs so smoothly at high speed that scarcely a vibration can be noticed. She also makes very little disturbance in the water. There is almost no bow wave, and the wake is hardly greater than that of a river tug. Her machinery was made on the Delaware, and was set up by engineers from the east.—The Engineer, New York.

In General.

"More Maritime Melodies" is the title of a neat little volume of poems and ballads of the sea, compiled by Morris Upham Bates and published by the Commercial Publishing Company of San Francisco.

The principal foreign naval powers now have 1,283 torpedo boats in commission and 182 in course of construction. The United States has two in commission, three provided for by appropriation, and the new naval appropriation bill provides twelve more.

The Insurance Company of North America, which has a fair share of patronage from lake vessel owners, presents an excellent annual statement. Total assets Dec. 31, 1894, $9,562,599.92; capital stock paid in, $3,000,000.00; net surplus, $2,244,269.10; income during 1894, $5,841,887.40. Total expenditures, $5,310,330.91.

The manufacture of feed heaters for marine purposes is not a matter of yesterday, but a record of one firm supplying feed heaters to boilers aggregating 2,685,000 indicated horse power, and these heaters being called upon to furnish 21,000 tons of water per hour for such power, is to say the least wonderful. The firm is John Kirkaldy, Limited, contractors to the British admiralty.

Whatever the lower house of congress may do regarding the report of the naval committee in favor of appropriations for three battle ships and twelve torpedo boats, it is more than probable that the senate will insist upon supporting the committee's recommendation as far as the three big ships are concerned, and builders are accordingly preparing for $9,000,000 or $10,000,000 worth of work in this line.

At Bath, Me., the experiment is being tried of soaking all of the timber of a 1,400-ton schooner, building for Philadelphia parties, with crude petroleum to save it from dry rot by exposure to the air and to prevent the ravages of the teredo worm in salt waters. Old wooden vessels which have been converted into bulk petroleum carriers after having outlived their usefulness in other trades, have been known to last for years after becoming soaked with either crude or refined oil.

Boxer is the name of the latest of the British torpedo boat chasers built by the Thornycroft company. She has broken all speed records for fast boats of her type. In one hour's trial, tested by six runs on the measured mile, three being with the tide and three against it, the mean speed attained was 29.314 knots. This is the highest on record, and is the more remarkable as the boat was down to her load draft of water, 7 feet 2 inches.

Excavation on the Manchester canal amounted to 50,000,000 cubic yards, one fifth of which was sandstone rock. The German excavators, in favorable ground, took out as much as 2,400 cubic yards in ten hours, but, like the French machines, could only be used for soft ground. The English excavators took out in soft soil nearly 2,000 cubic yards in ten hours, but they could be used in very hard material, and even rock, when this was first loosened by blasting. There were 194 steam cranes, 182 portable and other steam engines, and 209 steam pumps employed on the works, and the coal consumption was about 10,000 tons per month. The largest number of men employed was between 16,000 and 17,000.

Great speed, moderately thick armor, and numerous quick-firing guns are the requirements of the ideal fighting ship, viewed from the standpoint of Laird Clowes, who has become known as one of the ablest English authorities on naval matters. What he would have is a 101-gun ship, of which he has drawn the following picture: "A ship of from 10,000 to 12,000 tons displacement, carrying 6-inch steel armor all over her, steaming 22 or 23 knots, and mounting some such armament as sixteen 6-inch guns, twenty 4.7 inch guns, twenty 3-inch 12-pound guns, twenty 6-pound guns, all quick-firers, with twenty-five Maxims of a caliber somewhat larger than the one in present service use. Then we should have a 100 gun ship, against which no man-of-war in existence could stand up, and from which no man-of-war in existence could escape."—Cassiers' Magazine.

The Ashcroft Manufacturing Company, No. 111 Liberty street, New York, has received one of the largest single orders for indicators ever given in this country, The order is for forty-two improved Tabor indicators, special navy pattern. It is from the Cramps, and the indicators are for the American liners St. Louis and St. Paul. The Ashcroft company's agents are introducing these indicators abroad with flattering success.

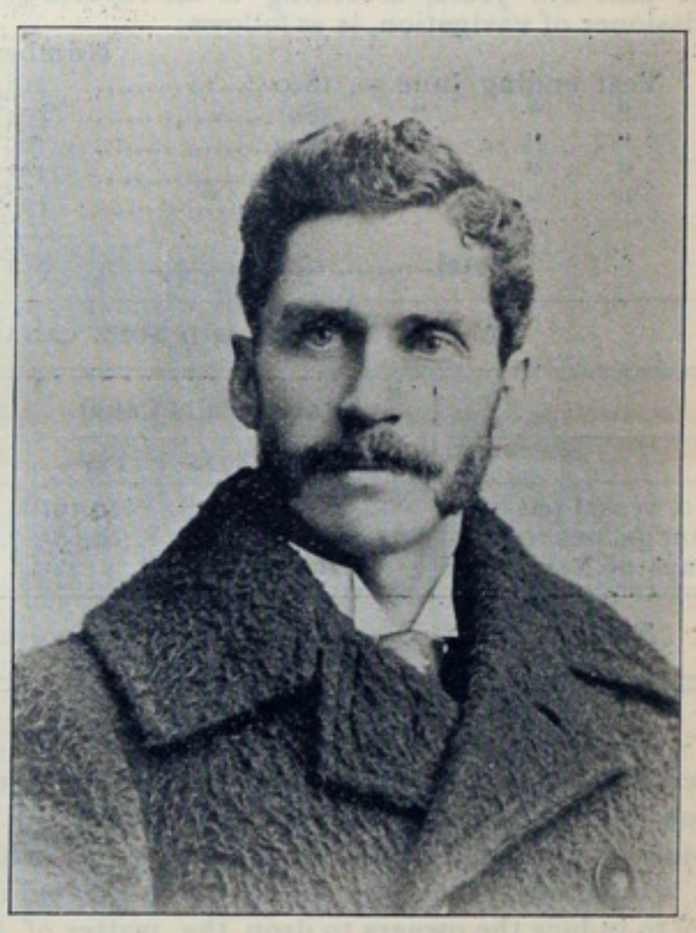
Faces Well Known to Cleveland Marine Men.

Portraits presented below are representations of faces familiar toCleveland marine men who have at any time during several years past been in the market for boiler or pipe covering, steam pumps or oil. Francis Line did quite an extensive boiler covering business in Detroit several years ago, but he found his element when he engaged with the Magnesia company, now the Keasbey & Mattison Co., Ambler, Pa. If anyone doubts the economy of having pipes or boilers covered with magnesia, let him gaze earnestly at Mr. Line's portrait and an immediate movement of the lips will be noted. He will tell you that the covering is fitted to every nook and corner of a complicated system of pipes and goes on and off like a glove. It is said of him that he was once the possessor of a pup that ate a great deal, but instead growing fat wasted gradually away, and was in daily fear of the sausage factory. Line concluded it was a case of loss of heat through condensation, and nothing but the earnest entreaty of his family prevented his putting a section of magnesia around that pup where it would do the most good. Mr. Line is among the most energetic of Cleveland sales agents. His office is at 117 Water street.

W. D. Kearfott left the employ of the International Navigation Company of Philadelphia, two years ago, and came to Cleveland to sell pumps for Henry R. Worthington, New York. It is needless to note that he has not forgotten what he came here for. In fact it has been on his mind to the exclusion of other things, all the time since. Shortly after his arrival, Mr. F. W. Wheeler gave a banquet at Bay City, to celebrate the laying of the keel of his hundredth boat, the Centurion. Kearfott had already won

F. W. JACKSON.

W. D. KEARFOTT.



FRANCIS LINE.

the good graces of almost everybody in the lake business at Cleveland, and of course he was invited to the launch. He was very social and wouldn't think of selling pumps on such an occasion, but he talked about pumps—Worthington pumps. Before the banquet was reached in the festivities at the ship yard, every builder and vessel owner knew Kearfott and had been reminded of Worthington pumps. Kearfott sat opposite Mr. James McBrier of Erie, at the banquet. Mr. McBrier had listened attentively to the pump discussion for quite a while and finally thought he would fix a death trap for the ambitious young representative of the big New York firm. "How long" said he very seriously, "have you been selling Worthington pumps?"

"Two weeks" replied Kearfott with that bland smile that is warranted to lift water 66 feet.

There was a roar, but when the smoke cleared away he said something about a Ball engine that so pleased McBrier that if he was ever in need of a pump he would no doubt send for Kearfott. In the two years since Kearfott came to Cleveland his territory has been increased to cover the state, and he has moved from desk room in a small Frankfort street office to a South Water street store house, has taken in two assistants and has an office that is surpassed by none of the Henry R. Worthington branches, excepting the New York and Philadelphia houses.

Last but not least is F. W. Jackson, marine representative of the Standard Oil Company. It is probably safe to credit Jackson with having originated the plan of contracting with owners for supplies of lubricants for the aeason, the oil being delivered from any of the numerous lake depots of his company. Whether he did or did not inaugurate this system, he knows how to get the contracts. In his early days he used to carry samples around in his pocket, and during his first season in the business on the river he wore a nice light suit of clothes. Some of the engineers took delight in rubbing up against Jackson while he wore the cream colored suit and finally, one day the cork worked out of the sample bottle. Dress reform was among the first lessons he learned in the business and later he quit carrying bottles on the conclusion that Standard oil is so well known that no samples were necessary and quit carrying bottles. There is no denying Jackson's claims as to the value, for lubricating purposes, of the oil he sells, but he has a matter of difference to settle with Capt. Lampoh who is among the well-known steamboat men on the lakes and whose veracity is not questioned. Capt. Lampoh had a very valuable dog that sailed with him for some time. The dog took sick in Milwaukee one day and the dock manager said that a dose of oil would fix him all right. It did. That was a year or two ago but Jackson says he is willing to pay the expense of having the remains exhumed and a post-mortem made to prove that it was not Standard oil that killed the dog.

Jerry Simpson on Aids to Navigation.

Jerry Simpson, once a lake navigator, showed in a few remarks in the house of representatives, the other day, relating to a light at Grand Marais harbor of refuge, that he had not forgotten experiences on Lake Superior. "This light is in connection," he said, "with a harbor of refuge on one of the greatest of the inland seas in the world, Lake Superior. It is, so to speak, at the lower end of that great lake. In storms or gales from the north, vessels can drift or sail before the wind through the body of the lake, but when they get to the lower end, if the weather is foggy or stormy, they must find some place of refuge. This light and fog signal, located at this harbor of refuge, is for the purpose of warning the mariner that he is near that harbor, so that he may take advantage of it. Now, if we have appropriated large sums of money and have been at work for years to construct this harbor of refuge, does it not seem a shortsighted policy not to make this small appropriation for this fog and light signal, so as to enable vessels that navigate that great inland sea to take advantage of the harbor of refuge that we have provided for them there? I fear that gentlemen who come from other parts of the country do not fully realize the importance of our inland navigation. It is said that during the season of navigation a vessel passes the city of Detroit every five minutes of the day and the night. Upon Lake Superior, in that far northern region, from the opening of navigation to the last of June or the first of July, it is very often foggy. The foggy days and nights far outnumber the clear days and nights, and the fog signals are really far more essential than are the light-houses themselves. I have sailed upon that great inland sea. I know the importance of that harbor of refuge, and the importance of such a signal as this, and the importance of putting it there at once. The expenditure of money should be no consideration whatever if it will save the lives and the property of the many thousands of people that are exposed to peril on those waters."

"SAILING DIRECTIONS FOR LAKE SUPERIOR, ST. MARY'S RIVER AND STRAITS OF MACKINAC" IS A PUBLICATION JUST ISSUED BY THE UNITED STATES HYDROGRAPHIC OFFICE. IT IS FAR IN ADVANCE OF PUBLICATIONS OF THE COAST PILOT KIND. PRICE $1. ADDRESS MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. WE HAVE NO HESITANCY IN RECOMMENDING THIS BOOK.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	104,515.00
" " " 1891	204	111,856 45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976 28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal		
	1893.	1892.	1891.	1893.	1892.	1891
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

MR. GEORGE UHLER, national president of the Marine Engineers' Beneficial Association, has formally requested the Lake Carriers' Association to give the marine engineers of the lakes a hearing on matters pertaining to wages, before a schedule of wages is fixed for another season. It is understood that one object which the engineers have in view is to try to induce the owners to drop the matter of fixed rates of wages for engineers from the wage card and permit of their dealing with owners as captains do. It is more than probable that the Lake Carriers' executive committee, having headquarters in Cleveland and controlling wages, will not consent to Mr. Uhler's request, although it would seem, from a disinterested standpoint, that the better policy would be to at least hear what the engineers have to say. If the refusal is based on the claim that the Lake Carriers can not recognize the engineers as an organization, the owners will be subjected to the criticism that as an organization they fix wages and restrict, through their organization, the payment of wages in excess of the amounts set down in their schedule.

TWO DAYS after the sinking of the North German Lloyd steamer Elbe, and when reports even as to the number of lives lost were very meagre and quite wide of the mark, an editorial writer on one of the Cleveland daily papers, thousands of miles from the scene of the accident, attempted to discuss, to the extent of a column or more, the question of which of the two steamers was to blame for the collision. The discussion went as far as dealing with what might have happened if the new laws for preventing collisions at sea had been in force at the time of the accident. Admiralty courts and the bright legal minds that deal with admiralty law will have no place if they are to face much of this kind of competition.

IT IS PROPOSED to place army officers connected with the engineer corps, who have anything whatever to do with disbursing the funds for engineering work, under bonds. The matter has been under consideration for some time past. The war department has prepared a list of disbursing officers who are bonded and who are not, and a copy has been transmitted to the auditor of the treasury department, who has been examining into the subject very thoroughly. In view of matters brought out in the proceedings against Major Overman of the engineer corps at Cleveland, some time ago, it would seem that the engineer officers themselves, whose commissions are their only bonds, should encourage the movement.

NOTWITHSTANDING the success of supporters of the Nicaragua canal project in the senate, it is thought now that the bill will not be given consideration in the house before adjournment. Speaker Crisp is opposed to it. He controls the committee on rules and can prevent the measure securing a hearing. This is certainly unfortunate for the canal company, as the administration is understood to favor the bill and public sentiment was rather favorably disposed to it also, on account of restrictions with which the senate surrounded all matters pertaining to the building of the canal and the money to be provided for its construction.

WHEN THE new lake rules for preventing collision were under consideration in the senate on Monday, Senator Brice asked if the bill contained any provisions relating to the manner of steering vessels, and at the same time called attention to the fact that in this regard the customs as to sailing vessels and steam vessels are diverse. Evidently the senator from Ohio has been giving some attention to the matter of difference in methods of steering, but upon being informed that the new rules of the road for the lakes contained no reference to the steering question he did not express an opinion or give any explanation of cause for inquiry.

CHAUNCY DUTTON, promoter, is in Washington with his St. Lawrence-Lake Champlain-Hudson river canal scheme, which would involve an expenditure of money sufficient to tax the resources of the wealthiest of nations, but which he is advancing as a private enterprise. He has succeeded in inducing Representative Daniels of Pennsylvania to introduce a bill providing for a charter for his company and is getting considerable newspaper notoriety. This latter item is, of course, most desired by the promoter.

ALL REPORTS regarding the sinking of the steamer Elbe agree that throughout the awful excitement aboard the ship, and the fight of passengers and crew for places in the life boats, the captain, having first in mind the women and children, stood on the bridge giving orders that were never executed. He went down with the ship, a great example of the kind of heroes that are made of discipline and responsibility through life on shipboard.

VESSEL owners of Milwaukee, Detroit and other places on the lakes are again complaining of unjust local taxation. The present United States commissioner of navigation and in fact all students of the subject of taxation as applied to vessel property agree that state systems are invariably inequitable. The ship is responsible to the national government. What's the matter with having all ships hail from Washington.

Call it the Goulder Act.

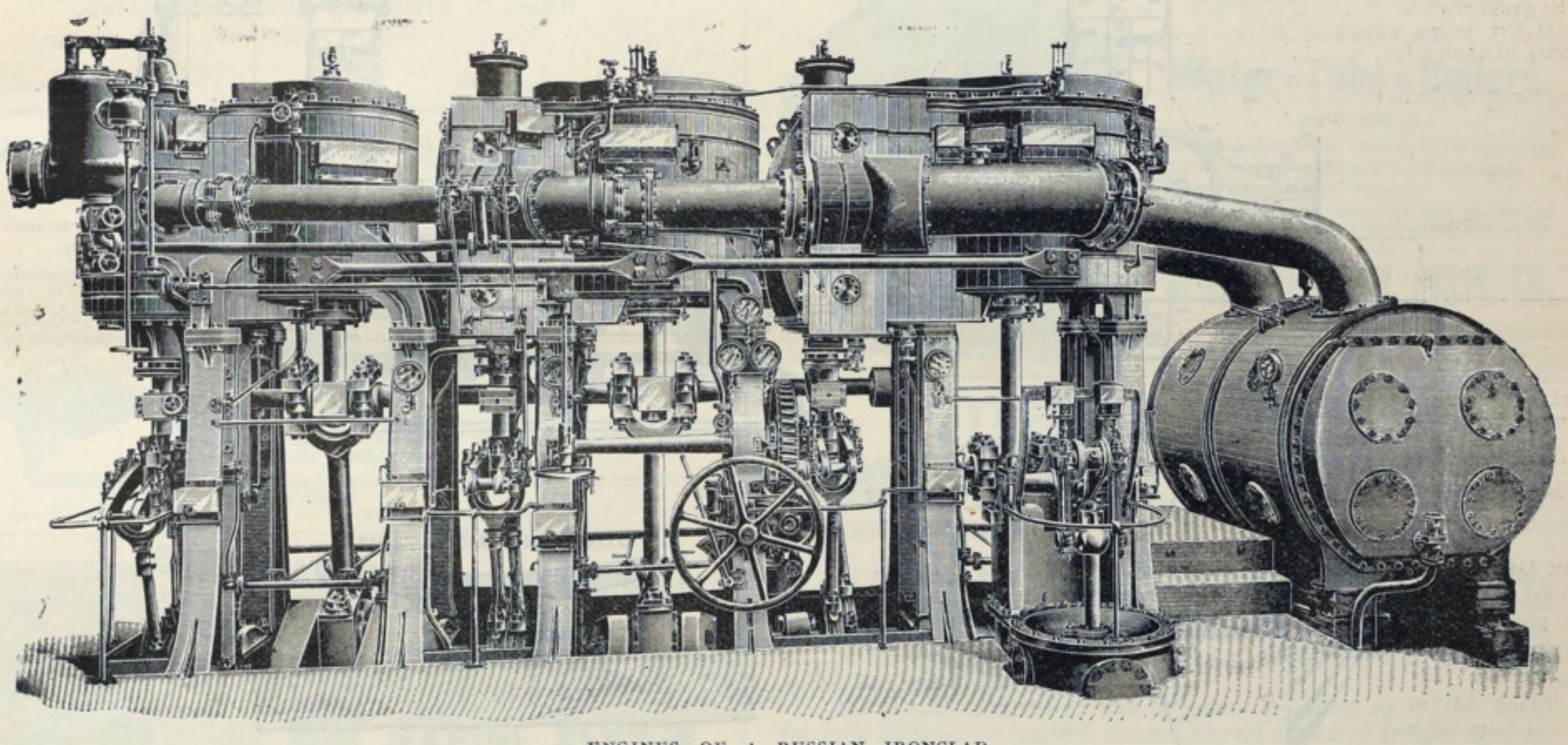
The United States senate on Monday passed by unanimous vote the bill providing rules for preventing collision in navigation of the great lakes, and there is no doubt of the measure being signed by the president in a few days. This bill insures to the lakes a code of rules that is in several important particulars—all of which are now well understood—separate and distinct from rules governing the navigation of sea going vessels or vessels on the rivers. The law embodies all that lake versel masters and owners sought for the safe navigation of their ships. But this change has not been brought about without a great deal of labor and painstaking effort on the part of a few masters and owners, upon whom the greater portion of the duty devolved. Some features of the new rules, especially the well-defined distinction that is now made between course signals and the simple code of fog signals, have been under consideration for three or four years past. All of the deliberations leading up to these changes, and all of the details preparatory to putting the whole matter of a change in the rules before congress in a manner that would demand attention, have been conducted under the immediate direction of Harvey D. Goulder, admiralty lawyer of Cleveland. Upon him has devolved the duty of not only preparing the rules and bills embodying the changes, but also that of going before congressional committees and presenting the arguments of owners and masters in support of these changes. It would seem, then, that as this new law is to apply only to the lakes, and as its provisions are such as to warrant the belief that it will remain upon the statute books for a great many years without material change, it would be highly fitting to refer to it in future as the "Goulder act."

The REVIEW has received from the Hydrographic Office several of the latest charts of Georgian bay harbor published by the British and Canadian governments. The charts include Penetanguishene harbor, approaches to Collingwood, Owen Sound, Rattle Snake harbor and several others. Copies of these charts may be examined and can be had at regular prices upon application at the office of the REVIEW.

Engines of a Russian Ironclad.

Engines illustrated on this page-were built by Maudslay Sons & Field, Limited, of London, for the Russian ironclad Admiral Oushakoff, which was launched at St. Petersburg a short time ago with great ceremony and in the presence of the late Alexander III and other government officials. The ship is intended for coast defence purposes and is 277.5 feet on the water line, 283.5 feet over all, 53 feet beam, 17 feet mean draft and 4,126 tons displacement. The engines were designed to develop 5,000 indicated horse power and to give a speed of 16 knots. There are two sets of triple expansion engines of the three-cylinder inverted type, having cylinders 31,46 and 68 inches in diameter and 33 inches stroke. Each cylinder is supported by four cast iron standards with cast iron crosshead guides bolted on their faces. The crank bearing frames are of cast iron and are bolted together so as to form one frame. The piston rods, connecting rods and shafts are of forged steel. The condensers, made of gun metal, are fitted with 5,094 horizontal tubes ¾ inches in diameter, through which the cooling water passes, the total cooling surface being 7,500 square feet. There are two single-acting air pumps of gun metal, 28 inches in diameter and 15 inches stroke, worked by beams from the low pressure cylinder crossheads. The propellers are of gun metal, three-bladed, arranged so that the pitch is adjustable from 13 feet 3 inches to 15 feet 3 inches, the diameter being 13 feet.

Steam is supplied by four double-ended cylindrical boilers 13 feet in diameter and 18 feet long, having in all twenty-four corrugated furnaces 3 feet 1½ inches in diameter and 6 feet 6½ inches long. The total area of fire grate is 490 square feet. There are 2,096 steel tubes 3 inches in diameter and 6 feet 10 inches long, having a total tube area of 11,300 square feet. The total heating surface is 13,700 square feet. Two funnels are fitted, 6 feet 6 inches in diameter and 80 feet in height.



ENGINES OF A RUSSIAN IRONCLAD.

Around the Lakes.

It is said that Capt. E. L. Smith of the Northern line freight steamer Northern Queen will sail the passenger steamer North West next season, Capt. Campau bringing out the North Land.

Howard P. Eells and John S. George, receivers of the Bucyrus Steam Shovel and Dredge Company of South Milwaukee, Wis., announce that under orders of the court the business of the company will be prosecuted as usual under their charge.

Both of the steel schooners building at South Chicago for the Minnesota Steamship Company have been launched, and there is no doubt of their being ready for service some time before the opening of navigation in the spring. Malta and Marcia are their names.

A circular from the Northern Steamship Company announces the resignation of Mr. T. P. Carpenter as general passenger agent, and adds that I. M. Bortle, who has been chief clerk under Mr. Carpenter, will continue in charge of the office work until a new passenger agent is appointed.

Capt. Thomas Wilson, M. A. Bradley, George Quayle, Capt. Geo. P. McKay and W. C. Richardson are among Cleveland vessel owners who will leave shortly on southern trips. A. A. Parker of Detroit is now in Florida. Capt. David Vance and R. P. Fitzgerald of Milwaukee are also preparing for a southern trip.

Directors and officers of the Minch Transportation Company of Cleveland, elected a few days ago, are: Directors, H. D. Coffinberry, Philip Minch, Robert Wallace, Capt. William Gerlach and I. W. Nicholas; presipent, Henry D. Coffinberry; vice-president, I. W. Nicholas; secretary treasurer and manager, Philip Minch.

Officers of the North Shore Navigation Company, Collingwood, Ont., electected recently, are: President, James Scott; vice-president, J. L, Burton; secretary and treasurer, C. E. Stephens; manager, M. Burton; accountant, C. A. MacDonald; directors, James Scott, J. L. Burton, C. E. Stephens, W. J. Sheppard and F. A. Lett.

John P. Gordon, son of General Manager Gordon of the Northern Steamship Company has resigned the position of general agent for the Northern company at Duluth and will hereafter represent the Union Transit Company at that point. This change undoubtedly had to do with some of the rumors connecting Mr. Gordon, Sr., with big changes in the Union Transit Company.

A sixth order lens, illuminating the entire horizon, has been substituted, without any other change in characteristics, for the one formerly in use on the south pier, entrance to Muskegon harbor. The light can now be seen from Lake Muskegon, and when just open beyond the hills on the south side of the channel between the piers furnishes a guide for entering that channel from the lake.

Stockholders of the Cleveland and Buffalo Transit Company met Wednesday and re-elected directors and officers who served last year. The list follows: President, M. A. Bradley; vice president, George W. Gardner; treasurer, R. C. Moody; secretary and manager, T. F. Newman; directors, M. A. Bradley, George W. Gardner, R. C. Moody, T. F. Newman, H. D. Goulder, George W. Avery, Daniel Shurmer.

Col. Wm. Edwards, Col. Myron T. Herrick, Col. George A. Garretson, Mr. James H. Hoyt and Col. James Pickands, all members of the Cleveland chamber of commerce and all leading citizens of Cleveland, have been in Washington recently, endeavoring to secure the establishment of an army post in Cleveland. Social features attending the location of officers of the regular army in leading cities of the country have probably in part prompted the efforts of these gentlemen in this regard.

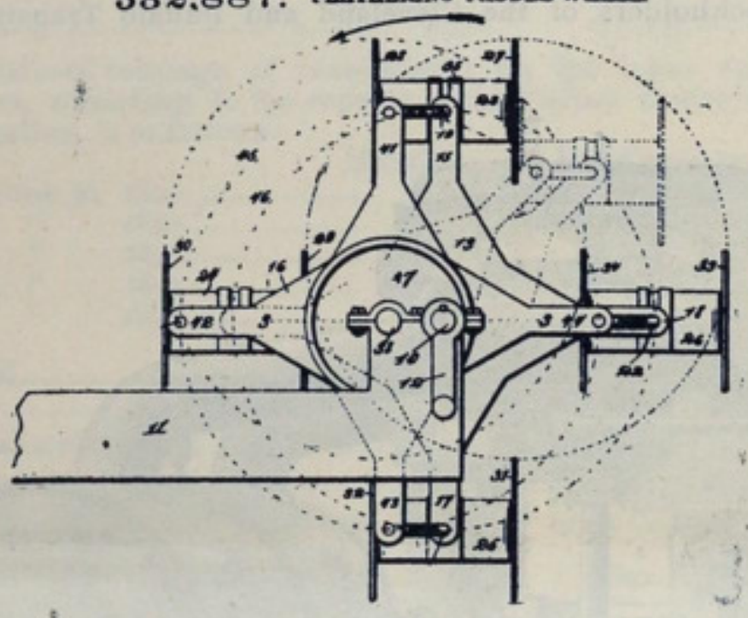
The search light with which experiments in displaying weather signals are to be made at the Chicago office of the weather bureau belongs to the navy department and was made for the battleship Maine. The light is powerful enough to throw its rays 20 miles from the tower of the Auditorium, where the experiments will be made. The weather bureau is also considering with railway officials the practibility of equipping passenger trains with small search lights by which storm signals could be given to the people living along the railways. Only north and south bound trains would be provided with these signals, observations having shown that the weather conditions are generally similar on like meridians, and that the majority of storms come from the east or the west. Secretary Morton believes that a small search light, capable of throwing a flash two or three miles from the rear end of a train, would prove of great service to the agricultural community in the case of approaching cold waves and storms.

Illustrated Patent Record.

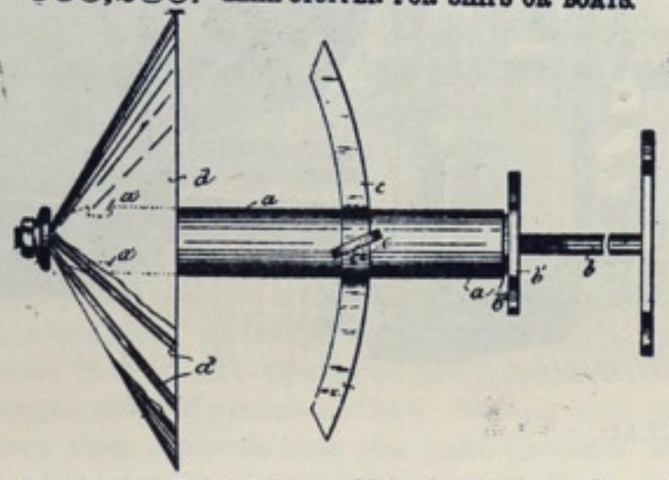
532,887. Feathering Paddle Wheel. Charles A. Long, St. Louis, Mo., assignor of one-half to Nicholas Pelligreen, same place. Filed Apr. 4, 1894. Serial No. 506,246.

Claim. The combination, in an improved motor wheel, of the opposite heads 13, 14, supplemental heads 39, 40, radial arms 15, 16, 17 and 18 on said heads 13 and 14, radial arms 41, 42, 43, 44 on said supplemental heads 39 and 40, suitable mountings for all of said heads, whereby the radial arms of the heads 13 and 14, and the radial arms of said supplemental heads will rotate in different orbits, crank-shafts 19, 20, 21, 22 rotatably mounted in and connecting the arms 15, 16, 17, 18 of one head to the like arms of the opposite head, said crank-shafts having each two squared or angular portions separated a distance, cross-bars 23, 24, 25, 26 arranged in pairs and having their outer ends bent laterally at right angles to the body thereof, and mounted one upon each of said squared portions of said crank-shafts, bifurcated clips 35, 36, mounted one upon each of the squared portions of said crank-shafts with bifurcations in said clips engaging said squared portions, the end portions of said clips being bent over and caused to embrace the top and bottom edges of said cross-bars, and blades or paddles arranged in pairs and secured in position upon the bent outer portions of said cross-bars.

532,887. FEATHERING PADDLE-WHEEL.



533,280. LEAK-STOPPER FOR SHIPS OR BOATS.



533,143. Steering Gear for Vessels. Mikle Schmaltz Bay City, Mich. Filed Feb. 5, 1894. Serial No. 499,150.

Claim. In a steering gear the combination with a small side hub wheel pivoted loose, on a proj cted end of a pilot's wheel shaft, with cable wound around hub carried around sheaves and extending to the valve stem frame, thence around the sheaves and forming an angle around the valve stem sheaves, thence under and around sheaves secured to the lower part of the cylinder casing, thence up and over sheaves secured to the top of the cylinder casing and placed around an annular grooved rim secured to the transmission wheel of the gear.

533,193. Nautical Cleat. William S. Granger, Chicago, Ill. Filed Dec. 18, 1894. Serial No. 532,195.

Claim. In a cleat, the combination with the arms and the stem thereof with means for securing the same in position, of a sheave rotatably mounted between the portions *e* and *f* of the cleat and adapted to form a bearing surface or guide for the sheets, to reduce the friction thereof when hauled in or hauled aft over the same, said cleat being adapted to serve as a means of securing the sheets.

533,280. Leak Stopper for Ships or Boats. Neal M. S. Douglas, Upper Pazud'n, Rangoon, Indiana. Filed Mar. 21, 1893. Serial No. 467,080. Patented also in England, France, Belgium, Canada, Italy and Spain.

Claim. In a leak stopper for vessels, the combination of the rod, the folding cover attached to the end of the same, the sleeve adjustably mounted on said rod and adapted to be forced against and to hold open the said cover, and the lever nut engaging with the said rod to adjustably hold the sleeve in place against the folding cover.

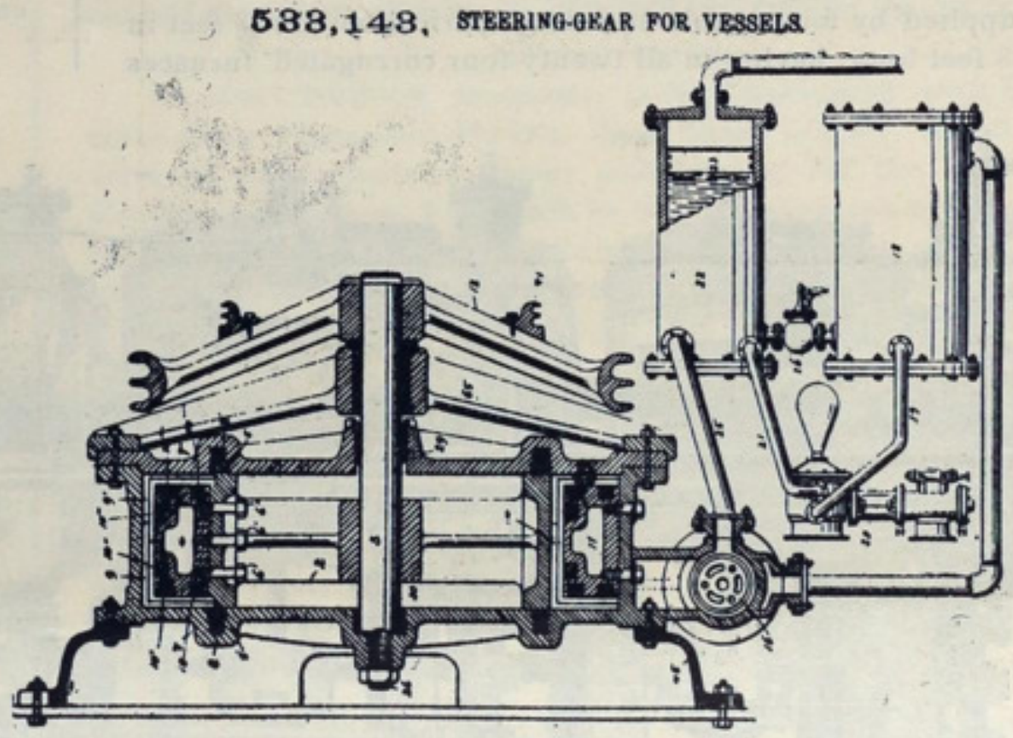
Trade Notes.

The Consolidated Safety Valve Company, New York, N. Y., has supplied a number of lake steamers with safety valves, all the large steamers built by the two Cleveland ship-building concerns being fitted with their make of valve. The St. Louis and St. Paul, American Line ships, are being equipped with these nickel-seated valves. The valves of phosphor bronze made for the government, are duplex and quadruple, and are arranged with lifting devices, so that they may be lifted from the bridge or engine room. They are magnificent specimens of workmanship and design. The Consolidated company has orders for safety valves for all war ships being completed by the Cramps. Since this company began equipping vessels of the new navy there has been no complaint of failure or giving out of valves.

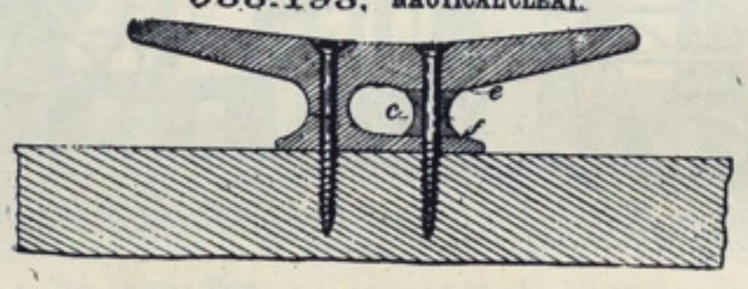
The Marine Iron Works, Chicago, has purchased the entire working plant and complete equipment formerly operated by Chas. P. Willard & Co. The plant is specially adapted to the building of high grade marine machinery in small and medium sizes, as well as steam yachts, general boat equipment, propeller wheels, etc.

The Harlan & Hollingsworth Company, Wilmington, Del., has contracted to build a steel racing schooner yacht from designs by A. Cary Smith, New York, for W. Gould Brokaw, New York yacht club. The boat will be 69 feet water line and 101 feet over all.

533,143. STEERING-GEAR FOR VESSELS.



533,193. NAUTICAL CLEAT.

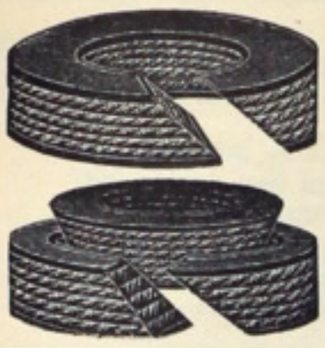


U. S. ENGINEER OFFICE, HICKOX BUILDING, 185 Euclid Avenue, Cleveland, Ohio, Jan. 17, 1895. Sealed proposals for furnishing and delivering timber, iron and stone, for construction of Pier at Conneaut Harbor, Ohio, will be received here until 2 o'clock p.m. standard time, Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb. 12.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio. Jan. 21, 1895. Sealed proposals for Extension of Piers, Improving Harbors at Huron, and at mouth of Black River, Ohio, will be received here until 2 o'clock p.m. standard time Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb.12.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio, Jan. 18, 1895. Sealed proposals for furnishing and delivering timber and iron for Repair of Pier at entrance to Monroe Harbor, Mich., will be received here until 2 o'clock p.m. standard time, Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb. 12.

U. S. ENGINEER OFFICE, 34 WEST CONgress St., Detroit, Mich., January 30, 1895. Sealed proposals for furnishing all labor, materials and appliances for A, Removing Portions of a Shoal at the Upper End of Hay Lake Channel and for B, Cleaning up Shoals near Nine Mile Point, Hay Lake Channel will be received here until 2 p.m. March 1, 1895, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application. O. M. POE, Col., Corps of Engineers, U. S. A., etc. Feb. 21.



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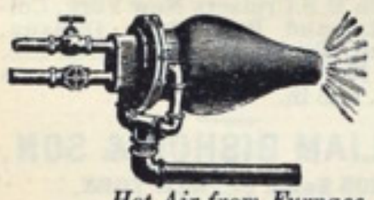

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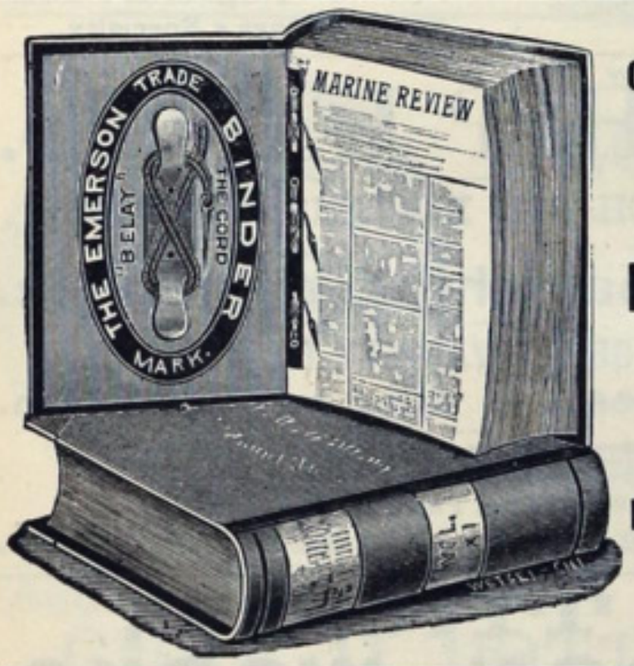

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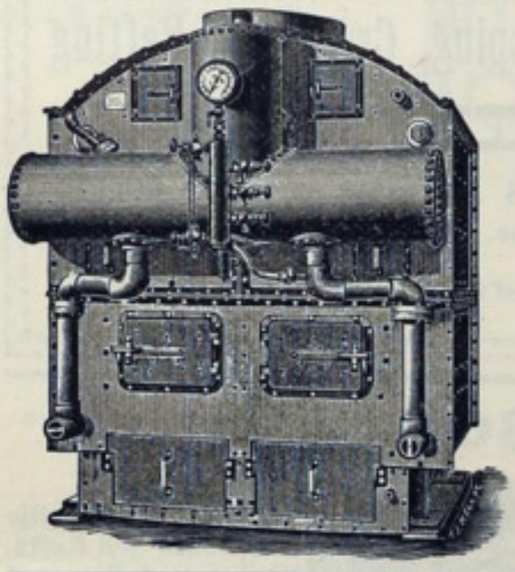

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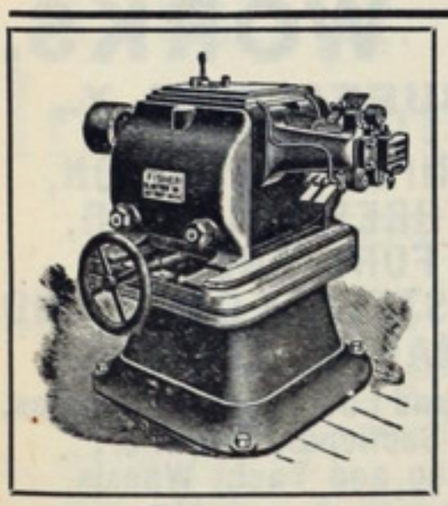

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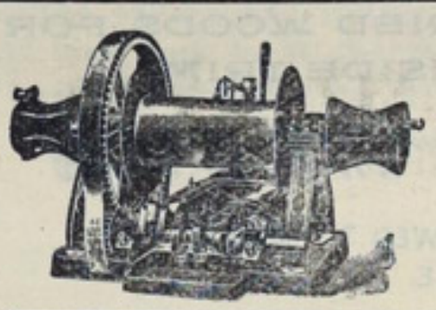

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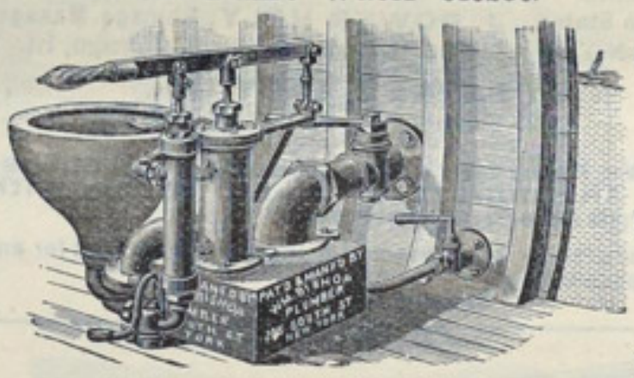

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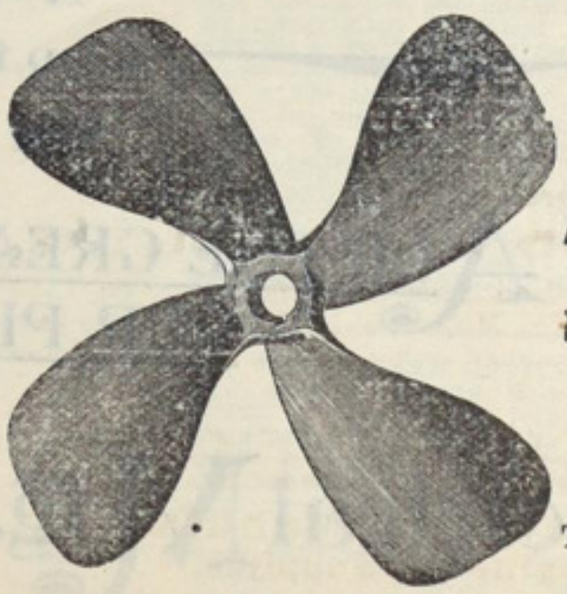

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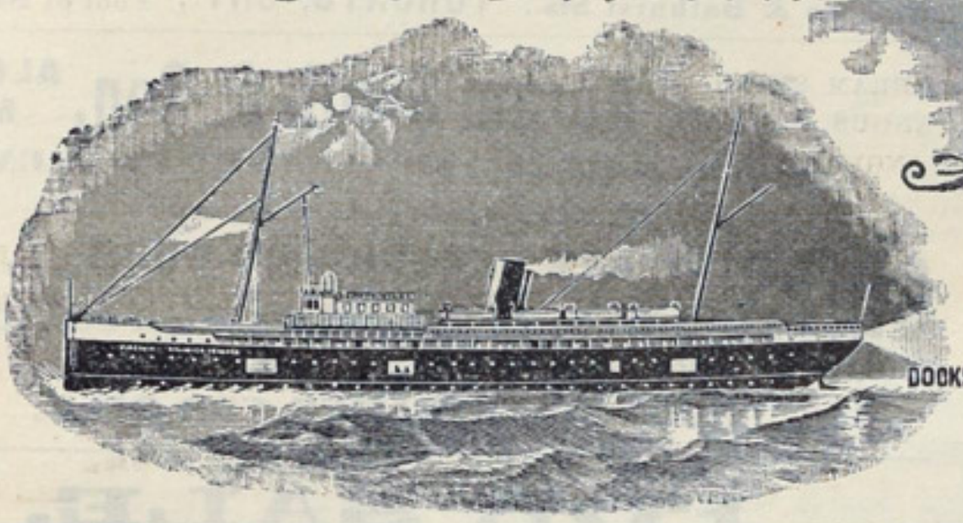

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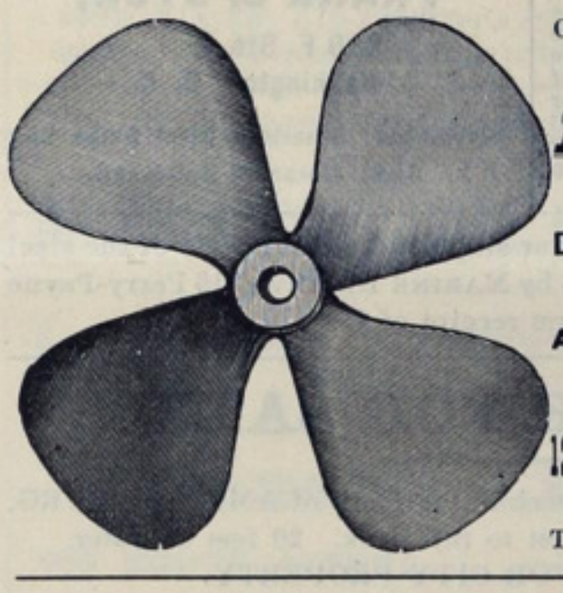

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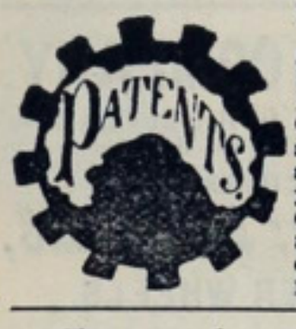

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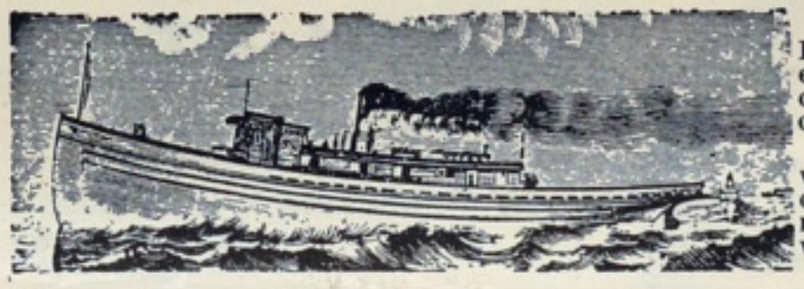

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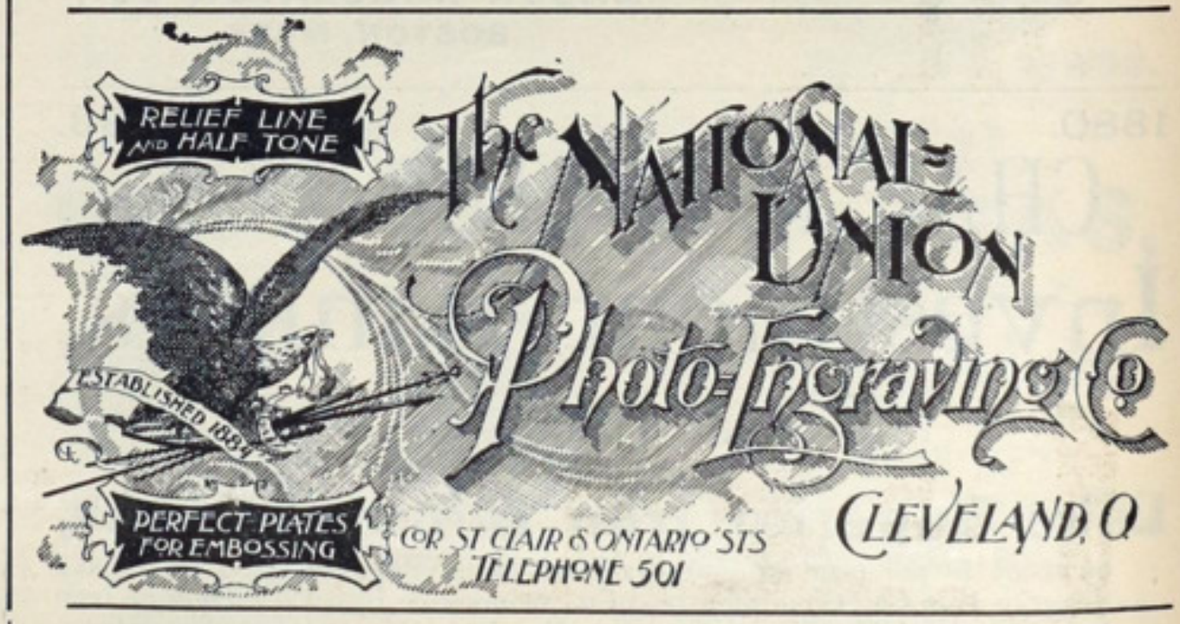

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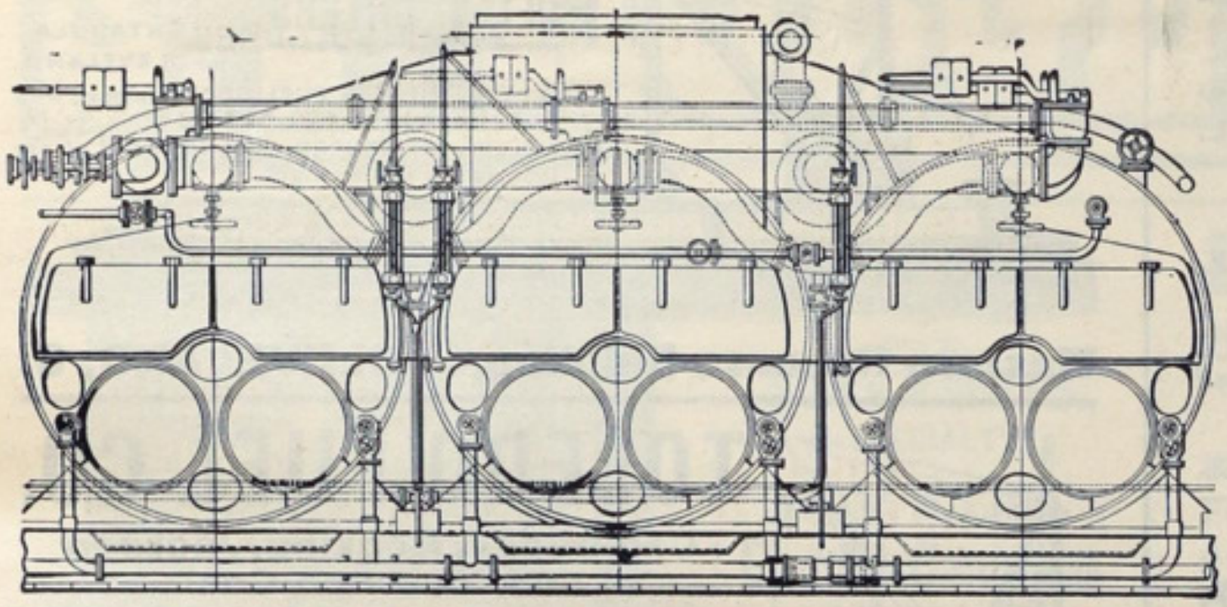

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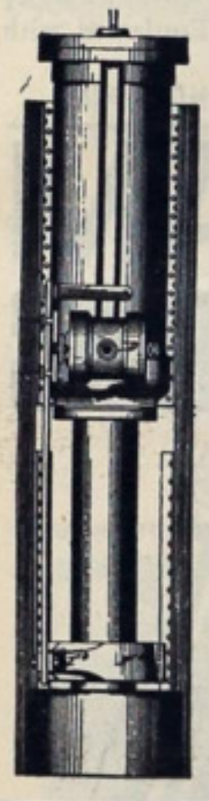

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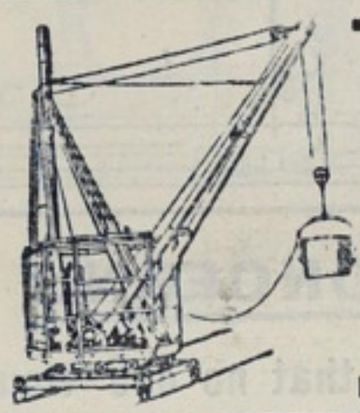

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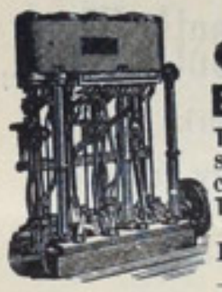

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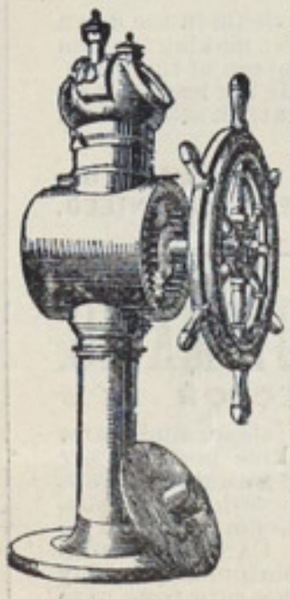

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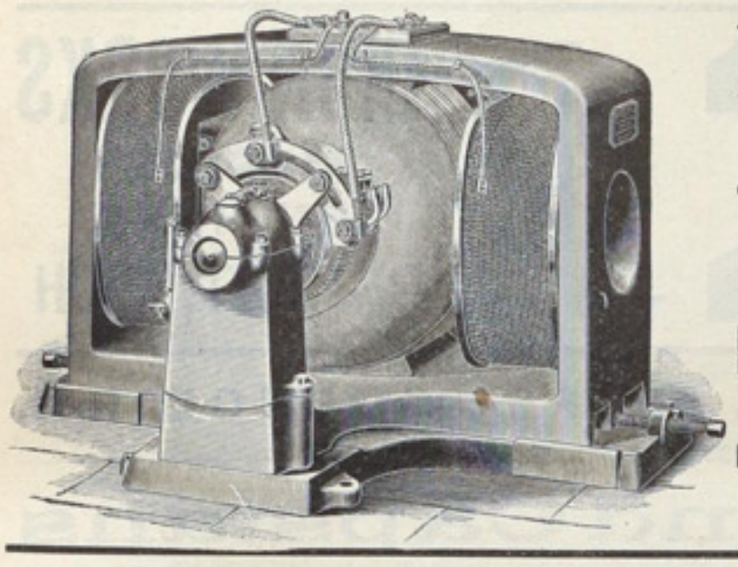

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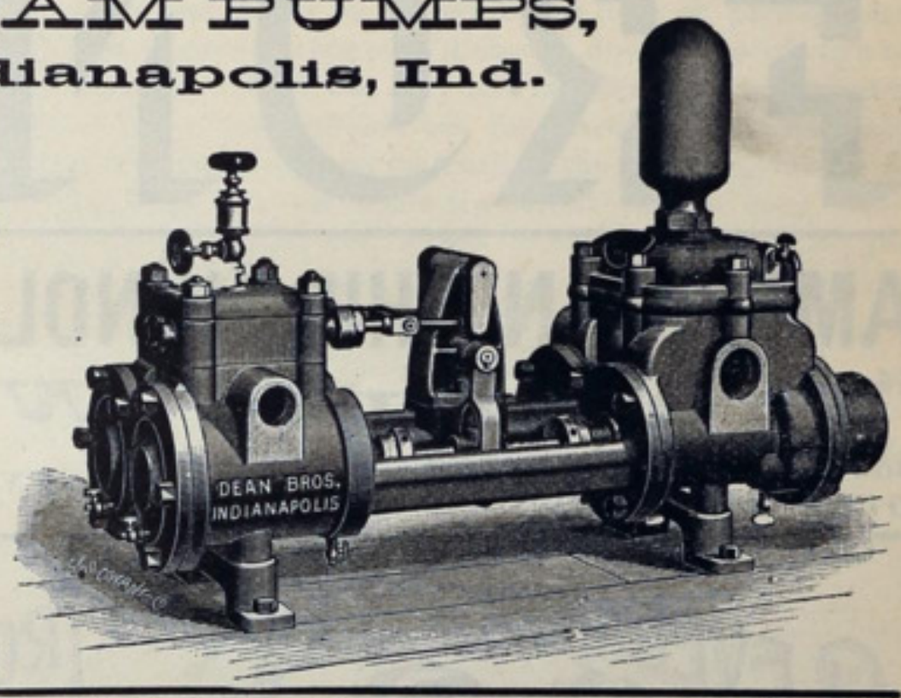

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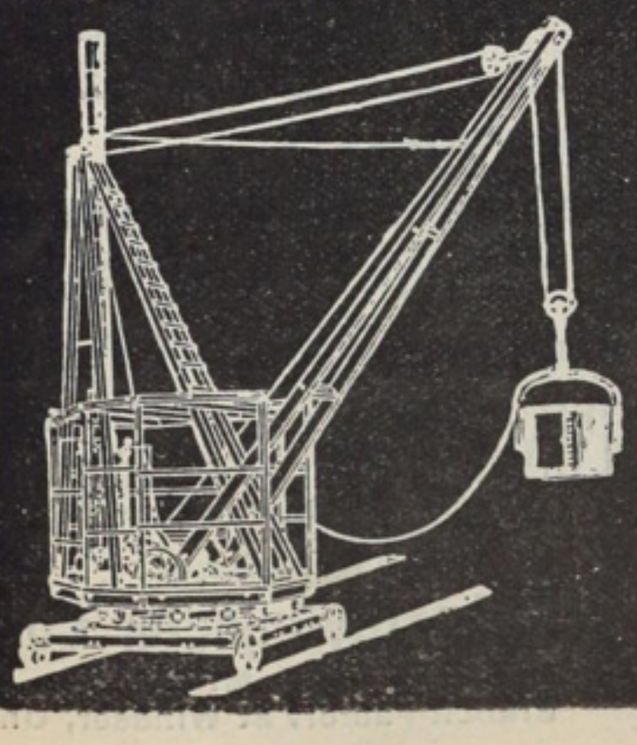

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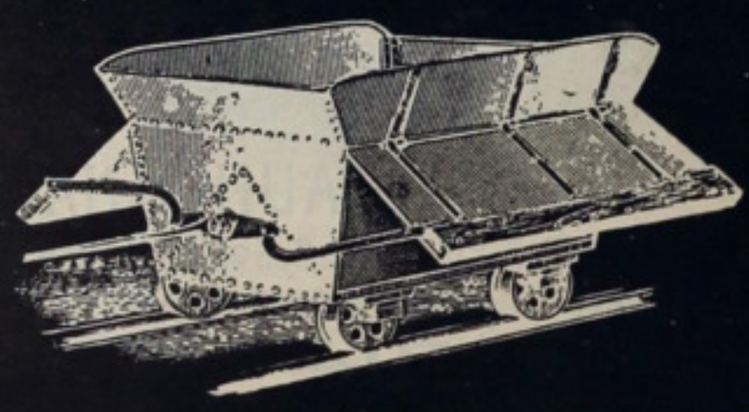

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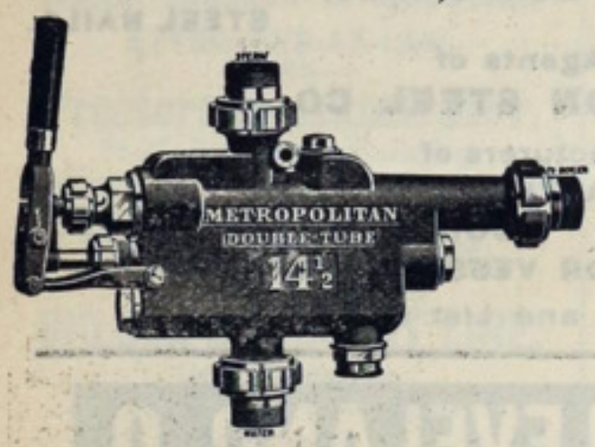

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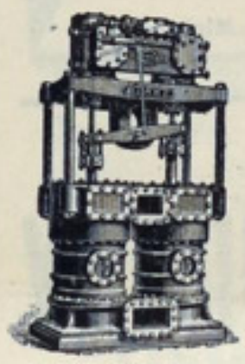

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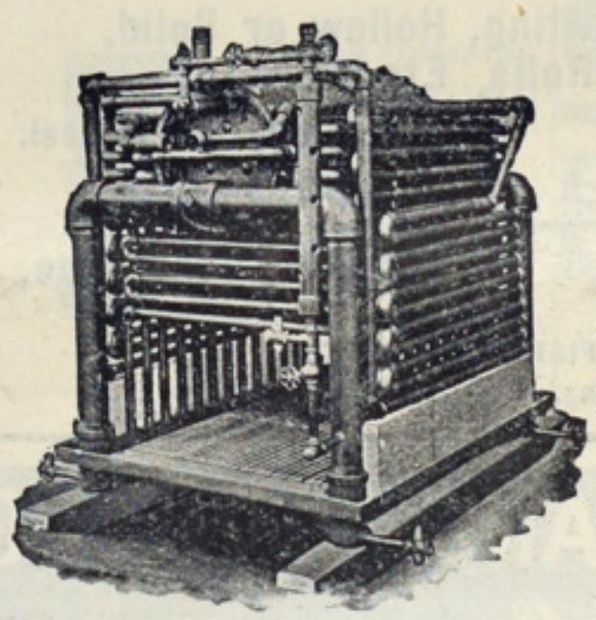

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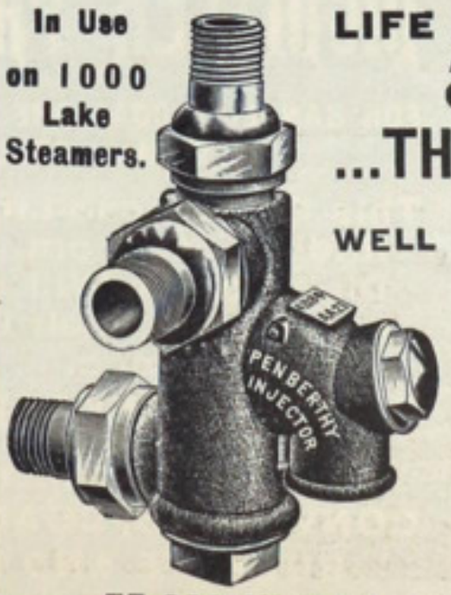

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